

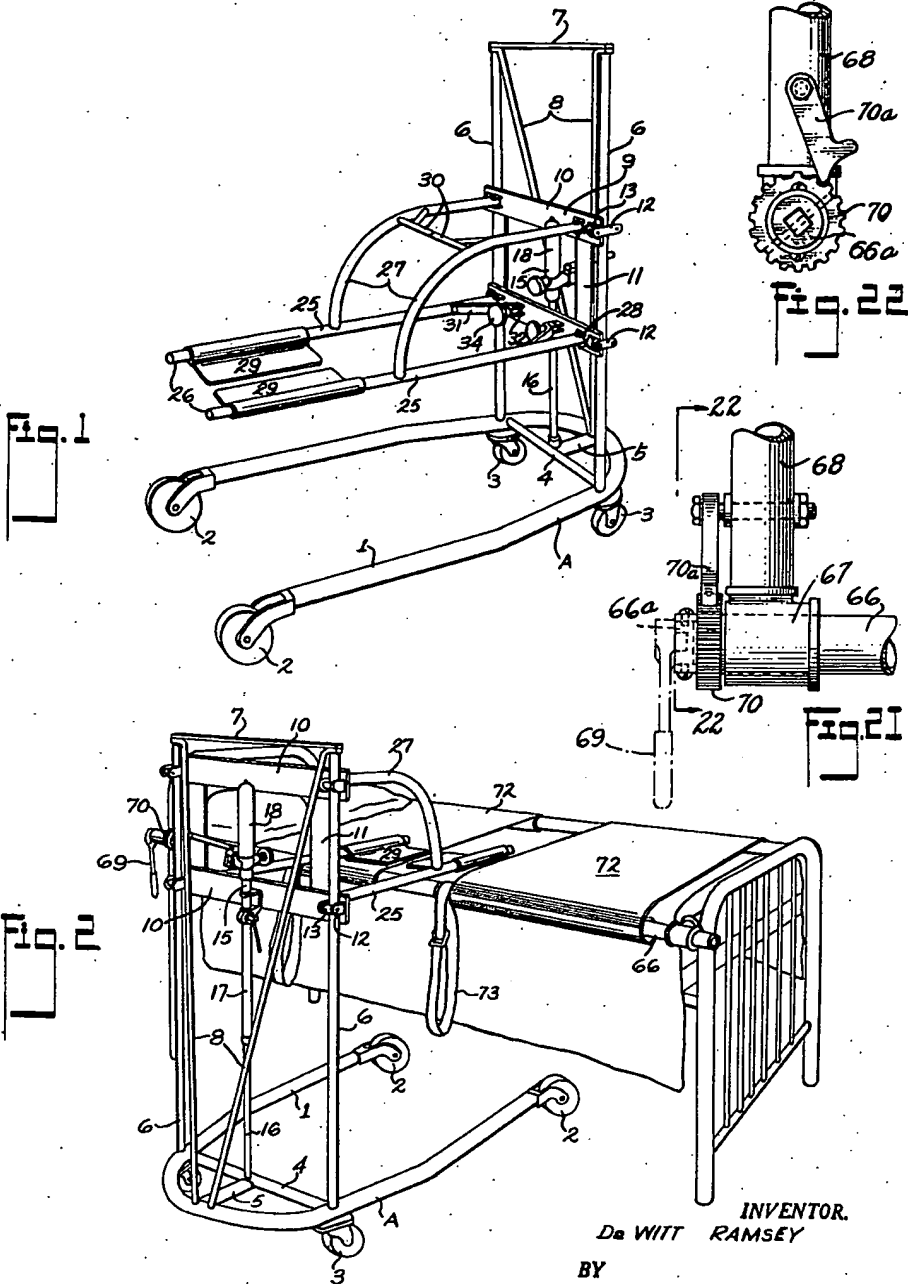
Oct. 7, 1958

DE WITT RAMSEY
SICK BED APPARATUS

2,854,673

Filed Sept. 30, 1954

5 Sheets-Sheet 1



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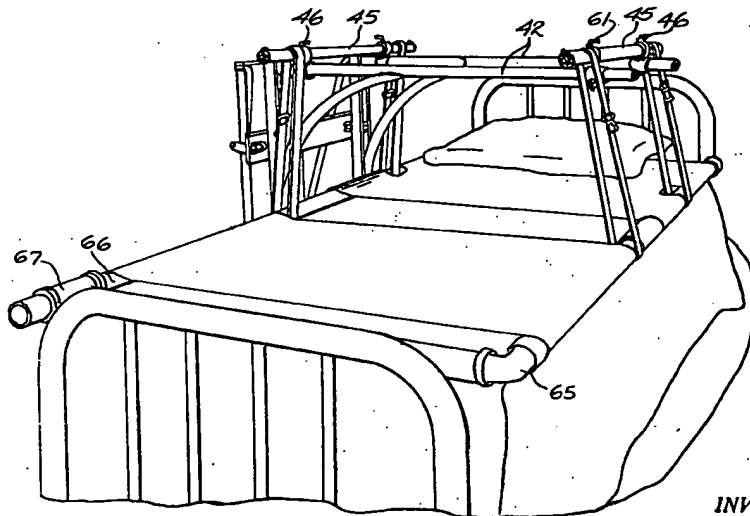
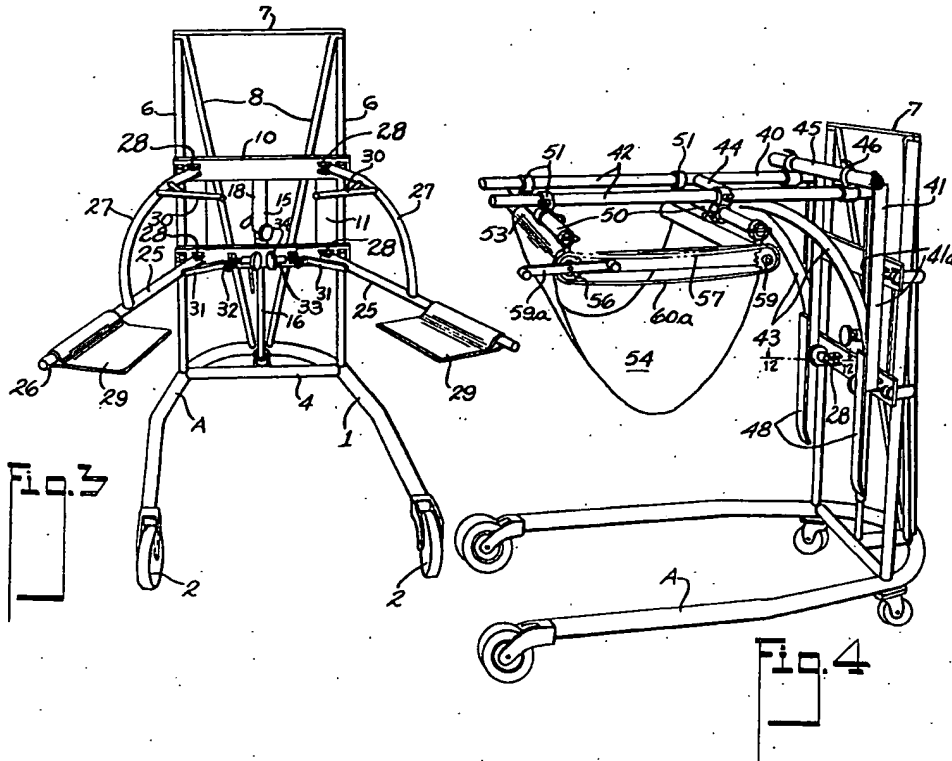
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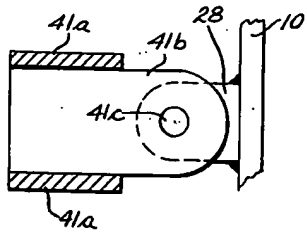
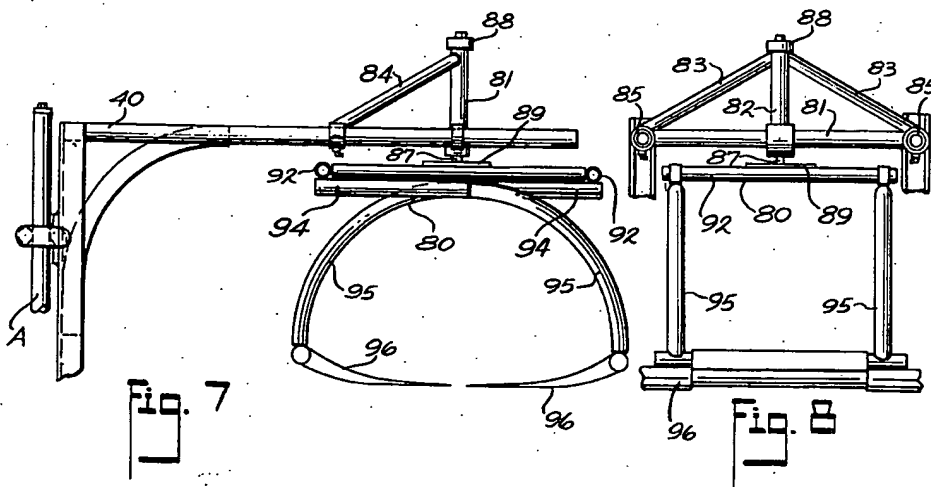
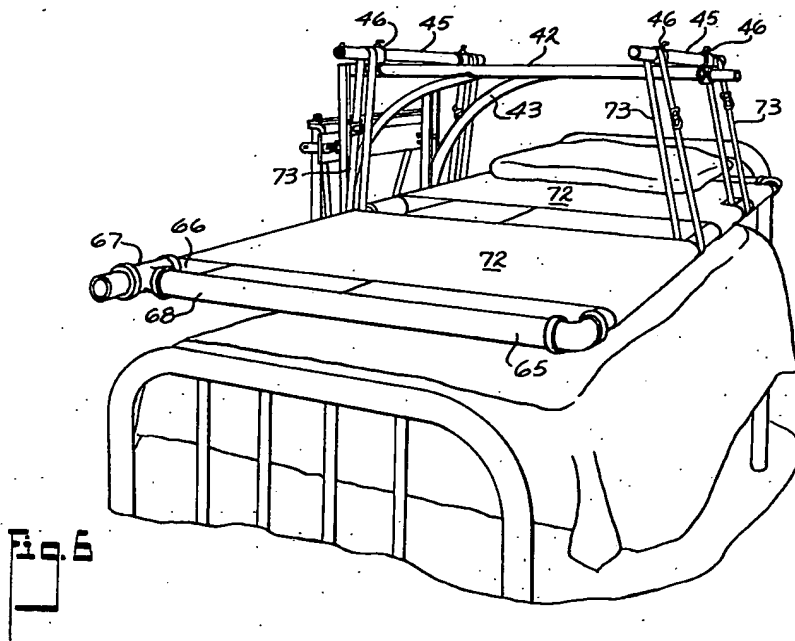
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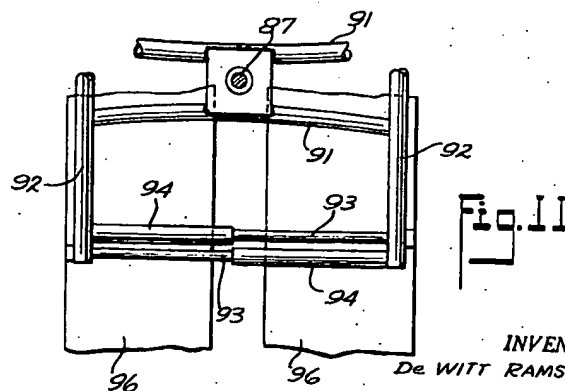
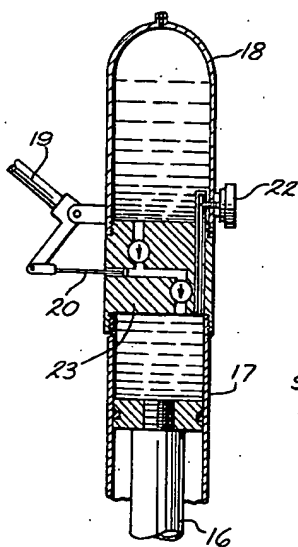
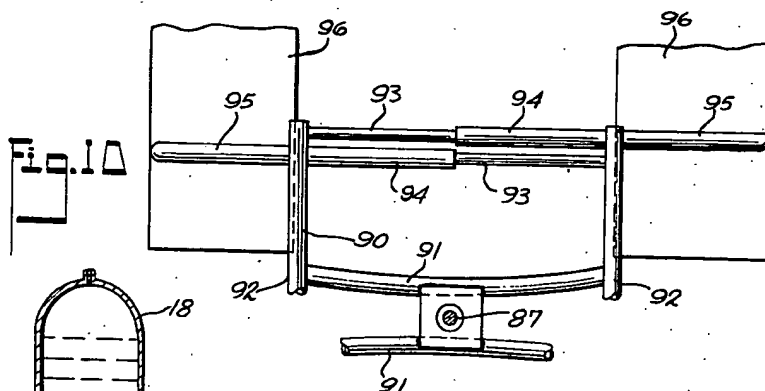
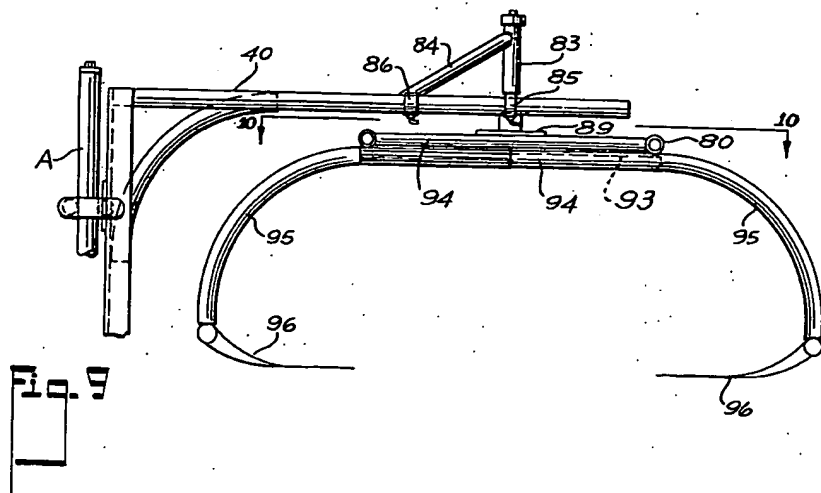
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5 Sheets-Sheet 4



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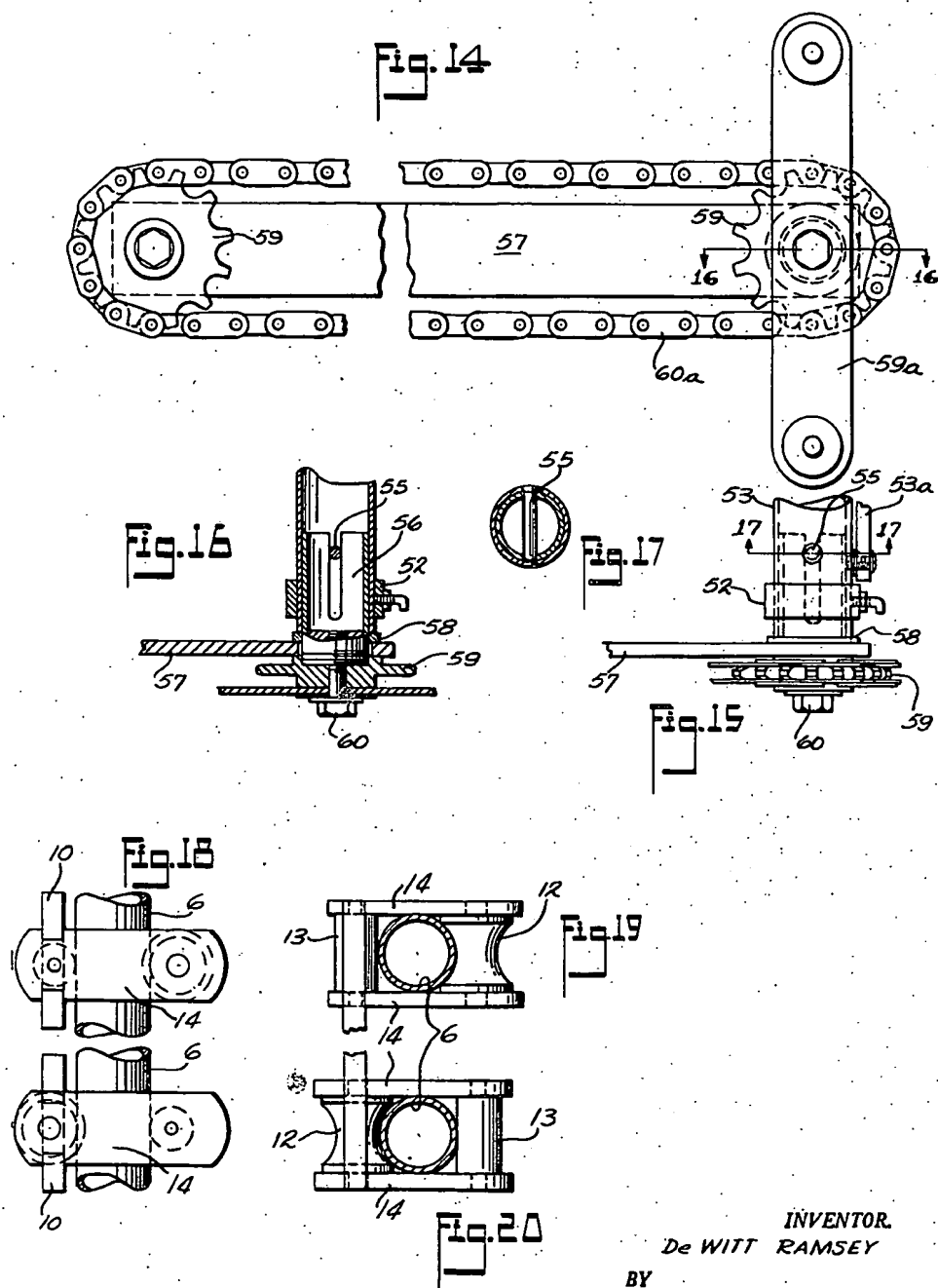
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5 Sheets-Sheet 5



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SICK BED APPARATUS

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Application September 30, 1954, Serial No. 459,292

4 Claims. (Cl. 5—86)

This invention relates generally to the art of handling patients in sickrooms and is particularly concerned with new apparatus for lifting, turning and transferring patients to and from a sick bed.

Many efforts have been made heretofore by workers in the art over a long period of time to devise apparatus by which one person could easily handle a patient who is unable to move about unaided. Some of the apparatus proposed was for lifting and lowering patients, others were for turning a patient while still others were for transferring a patient to or from a bed. However, each of these different classes of prior devices with which I am familiar has one or more serious drawbacks and disadvantages and none is what might be called universal apparatus, i. e., one which is capable of performing all these necessary services. So far as I know, no apparatus had ever been proposed, prior to the present invention, which could be used in the home as well as in the hospital, i. e., none of the prior proposed devices was sufficiently simple, compact and easily manipulated for use in the limited space available in a residence as well as in the larger spaces available in the hospital.

The present invention aims to provide a universal apparatus which can be used effectively in various places such as in a bedroom at home, in a private room in a hospital and in a hospital ward; which can be operated by one person with the exertion of but little energy even when the patient, with or without heavy casts and the like, may weigh several hundred pounds; and which, when not in use, may be stored in a relatively small amount of space remote from the patient's bed.

These aims are achieved by the present invention which is embodied in a new combination of elements wherein the elements cooperate to produce a new and valuable result beyond that attainable by the same elements acting separately. The present invention will be better understood by those skilled in the art from the following specification and the accompanying drawings, in which:

Fig. 1 is a perspective view of one embodiment of the present invention and including means for transferring a patient from between a bed and a chair;

Fig. 2 is a perspective view showing the apparatus of Fig. 1 in position to transfer a patient from a bed;

Fig. 3 is a front, elevational view of the apparatus of Figs. 1 and 2 with the patient-carrying arms separated after discharge of a patient;

Fig. 4 is a perspective view showing the frame of the apparatus of Fig. 1 but with the swingable arms of that apparatus replaced by fixed arms and mechanism for rolling or turning a patient over;

Fig. 5 is a perspective view showing the frame of Fig. 1 equipped with the fixed arms of Fig. 4 and provided with means for lifting a patient-carrying rectangular frame surrounding the mattress of the bed;

Fig. 6 is a view similar to Fig. 5 but showing the rectangular frame in raised position above the bed;

Fig. 7 is a side elevational view of the frame of the

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apparatus of Fig. 1 provided with the fixed arms of Fig. 4 and with means for lifting, swinging and transporting a patient in prone position, the lifting means being shown in end elevation;

Fig. 8 is a fragmentary, side elevational view of the lifting means of Fig. 7;

Fig. 9 is a view similar to Fig. 7 but showing the lifting means in position preparatory to being lowered to pick up a patient;

Fig. 10 is a fragmentary, top plan view, partly in section, taken on line 10—10 of Fig. 9;

Fig. 11 is a view similar to Fig. 10 but showing the bed plates in retracted, patient-carrying position;

Fig. 12 is a fragmentary, horizontal view, partly in section, taken on line 12—12 of Fig. 4;

Fig. 13 is a vertical, sectional view showing the hydraulic lift of Fig. 1;

Fig. 14 is an enlarged side elevational view of the roll turning, tape winding apparatus of Fig. 4;

Fig. 15 is a fragmentary, top plan view of the apparatus of Fig. 14;

Fig. 16 is a sectional view taken on line 16—16 of Fig. 14;

Fig. 17 is a sectional view taken on line 17—17 of Fig. 15;

Fig. 18 is a fragmentary, side elevational view showing details of the arrangement of parts of the carriage, its rollers and the carriage guide;

Figs. 19 and 20 are, respectively, top plan views of the upper and lower sets of rollers on the carriage;

Fig. 21 is a fragmentary top plan view of the tube rotating mechanism of Fig. 2; and

Fig. 22 is an end elevational view taken on line 22—22 of Fig. 21.

In the apparatus shown in Figs. 1 to 3, the frame, designated generally by A, consists of a horizontal U-shaped base 1 provided with wheels 2 and casters 3 so that the apparatus may be moved about easily. Braces 4 and 5 are connected to each other and to the U-shaped base adjacent to the casters 3, i. e., remote from the free ends of the U-shaped base.

The frame also includes a carriage guide which consists of two parallel uprights 6 which are attached to the base above casters 3, are connected together in their upper ends by top rail 7 and are braced by braces 8 extending from the tops of the uprights to the frame adjacent to brace 5. Preferably, these uprights, as well as the base 1 and braces 4, 5 and 8 are made of tubing.

Carriage 9 consists of parallel horizontal plates 10 and vertical plates 11 connected as by welding to form a rectangle. Each horizontal plate 10 carries near each end a roller assembly consisting of rollers 12 and 13 mounted in plates 14 welded to plates 10. The plates 14 of each roller assembly are disposed on opposite sides of the adjacent upright 6 with the rollers engaging opposite sides of the upright. Preferably the rollers engaging one upright 6 are reversely arranged, i. e., as shown in Figs. 18 to 20, the larger rollers 12 in the upper assemblies engage one side of uprights 6 while rollers 13 in the lower assemblies engage the opposite sides of the uprights. This arrangement of large and small rollers avoids flattening or crushing of the uprights and gives a rigid, easy operating carriage when loaded, a fact which gives confidence to the patient.

Means for moving the carriage 9 vertically in the guide, as shown (see Fig. 13), comprises a hydraulic lift 15. This lift includes a rod 16 fastened at its lower end to brace 5, a tube 17 surrounding rod 16 and attached to the lower horizontal plate 10 of carriage 9, a fluid reservoir 18 at the upper end of tube 17 and a lever 19 to actuate a piston 20 in reservoir 18 and

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thereby force liquid into tube 17 with resultant upward movement of carriage 9. When piston 20 is moved inwardly, air is forced up into reservoir 18, and when the piston is retracted, the air pressure in reservoir 18 forces liquid down into tube 17 with resultant upward movement of tube 17 and carriage 9. When the carriage is to be lowered a needle valve 22 is retracted to permit liquid to flow through passage 22 from tube 17 below plug 23 into reservoir 18 above the plug.

Any readily operated means for raising and lowering the carriage may be substituted for the apparatus just described.

In Figs. 1, 2 and 3, the carriage 9 is provided with a pair of pivoted arms 25. As shown, each arm includes a horizontal part 26 and a brace part 27, these two parts being pivoted in ears 28 attached to carriage 9. Since these pivots are arranged in vertical pairs, each arm may swing horizontally from a position substantially at right angles to the carriage, as is shown in Figs. 1 and 2, to the opened position as shown in Fig. 3. The free end of each arm 25 is provided with a half seat 29, these two seats extending toward one another from the horizontal parts 26 of the arms and leaving a space between their adjacent edges of preferably no more than about an inch.

Braces 27 have stops 30 extending toward each other to engage end to end when the arms 26 are fixed in patient-carrying position. When arms 25 are substantially parallel, they may be secured in that position as by means of angle straps 31 attached to horizontal parts 26 near their pivoted ends and provided with slots 32 to receive eye bolts 33 which are pivoted to the lower horizontal plate 10 of carriage 9 and which carry nuts 34. When the eye bolts 33 are located in the slots 32 of straps 31 and nuts 34 are tightened, the horizontal arms are fixed in parallel position.

The apparatus of Figs. 1 to 3 may be operated substantially as follows: Assume that a patient is to be transferred from a sitting position on the side of a bed to a chair. The frame A is moved toward the bed with the pivoted arms 25 spread apart as shown in Fig. 3 but with those arms at such an elevation that when the frame A is moved toward the bed, the half seat 29 will just clear the top of the latter. As the frame is moved toward the bed, the half seats move on opposite sides of the patient's legs and, when in proper position, the pivoted arms 25 are manually swung one at a time under the patient who is leaned away from the arm, thereby bringing the half seats under the patient. Then arms 25 are locked in parallel position by the locking means just described. Then the patient may grasp the stops 30 to steady himself while the attendant actuates the hydraulic lift to raise the patient off the bed, whereupon the frame A and the patient may be moved away from the bed and to the place where the patient is to be deposited, for example, in a chair. Then, with the patient positioned above the chair, the hydraulic lift is manipulated to permit fluid to flow out of tube 17 into reservoir 18 with resultant lowering of the carriage 9 until the half seats 29 are substantially in contact with the chair seat. Then the nuts 34 are turned on bolts 33 until the latter can be moved out of the slots 32 in straps 31 after which the arms are moved away from one another to lower the patient onto the chair.

It will be noted that the frame A may be moved close to the bed without interfering with any parts of the latter. This is due to the fact that the base 1 is positioned close to the floor and is supported on rollers which do not engage any parts of the bed; and is also due to the fact that the arms 25 can be elevated to a level above the bed and moved thereacross. Moreover, the U-shaped base 1 with its widespread legs can be moved up close to a chair, with the legs of the frame straddling those of the chair.

In Fig. 4 the frame A is the same as in Figs. 1 to 3

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but the pivoted arms 25 and their attachments have been replaced by a cantilever type support 40. This support consists of two parallel, vertical columns 41, horizontal arms 42, curved braces 43 secured to the columns and arms and a cross bar 44 connecting the arms 42 together. Preferably each column 41 consists of two flat parallel plates 41a (see Fig. 12) between which the ends of arms 42 and braces 43 are positioned and welded in place. Also, plates 41b are welded between plates 41a to fit between each pair of ears 28 and have holes 41c. The columns 41 are secured to the carriage 9 by pins which extend through each pair of ears 28 and the plate 41b therebetween. A cross member 45 is attached to arms 42 between braces 43 and columns 41 by hangers 46. Guards 48 depend from columns 41 to prevent engagement of the lower ends of columns 41 with a bed or other furniture or objects when the carriage is being lowered. The arms 42, braces 43, cross bar 44 and cross members 45 are preferably tubes.

In Fig. 4 the support 40 is shown as being equipped with means for turning or rolling a patient. This means includes a pair of spaced apart, parallel tubes 50 which are attached to arms 42 by hangers 51. Roller supporting hangers 52 depend from the ends of tubes 50 and support tubes or rollers 53 onto which the ends of a long broad tape 54 are attached. The rollers 53 are rotatably mounted in hangers 52. As is better shown in Figs. 14 to 17, inclusive, each tube 53 is provided with a longitudinally extending locking bar 53a spaced apart from the roll to receive an elongated tape 54. Each tube 53 carries a cross pin 55 near its ends. A tubular plug 56 having slots to receive pin 55 is positioned in one end of each tube 53. A tie plate 57 surrounds and extends between plugs 56, is spaced from the ends of tubes 53 by a collar 58 and is held in place by sprockets 59 which are screwed onto, or otherwise suitably fixed to, plugs 56. Crank 59a is secured to one sprocket 59 as by a bolt 60 and serves to rotate that sprocket and turn its roller and also to drive chain 60a and thereby rotate the other sprocket and roller.

The apparatus of Fig. 4 may be operated substantially as follows: The tape 54 is placed under the patient at the desired place. The tape should extend approximately six inches beyond one edge of the bed and should be approximately 30 inches longer on the other side of the bed. Then the apparatus is brought to the bed and support 40 is lowered until the rollers 53 are just above the patient or approximately 12 inches above the bed. The rollers 53 are turned until the locking bars 53a are on the underside.

The short end of the tape is inserted between the bar 53a and roller 53 and is pulled through approximately six inches, then the roller 53 is turned inward at the top until all slack has been taken up which should give at least two complete turns of the tape on the roller 53. The other end of the tape is similarly secured to the other roller 53 which will have about seven turns of tape on the roller. When all slack has been taken up, the roller rotating means is assembled with the rollers, as may be done by inserting plugs 56 in the ends of rollers 53 with pins 55 extending through the slots in the plugs, as shown in Figs. 14 to 17, with the crank 59a being positioned at the roller having the short end of the tape. This locks the rollers against turning except when the crank is rotated. Then the support 40 is raised to lift the patient from the bed, after which the crank 59a may be rotated to turn the patient away from the short end of the tape and its roller. The patient may be turned back simply by reversing the rotation of crank 59a. After the patient has been lowered onto the bed, the tape may be removed from rollers 53 and the apparatus wheeled away from the bed.

Another important feature and use of the turning rig is to move the patient lengthwise on the bed. This is accomplished by suspending the patient clear of the bed

and then sliding roller support bars 50 lengthwise through hangers 51.

In Figs. 5 and 6, the apparatus shown is that of Fig. 4 but with the patient-turning apparatus removed therefrom and replaced by other lifting apparatus. In this case the arms 42 of support 40 are fitted with another cross member 45 near their free ends by means of hangers 46. Each of the hangers 46 is shaped to receive two tubes at right angles to each other and is provided with hand operated set screws 61 to engage the outer surface of the tube within the hanger and hold it in fixed position.

A rectangular frame 65 surrounds the mattress of the bed. This frame is preferably constructed of tubing and one side tube 66 is preferably made rotatable, as by projecting through tubular fittings 67 attached to end tubes 68. Means for rotating tube 66, as shown, includes a lever 69 (see Figs. 2, 21 and 22) fitting into the socket in a plug 66a attached to tube 66, a ratchet 70 surrounding and attached to tube 66 and a dog 70a engageable with the ratchet 70 and pivotally attached to the adjacent end of tube 28 near fitting 67. One or more, in this instance two, tapes 72 are fastened to the fixed side tube, extend across the top of the mattress and are fastened to both side tubes. When lever 69 is actuated, the tapes may be pulled taut between side rails 66 and a patient may be supported on those tapes when the frame is lifted. Each side tube of the frame 65 is provided with two straps 73 and these straps may be slipped over the ends of lifting tubes 45 after which the hydraulic lift may be actuated to raise the cantilever support 40 and frame 65 with the patient on the tapes. Fig. 6 shows this actuated position of the frame with the patient and frame some little distance above the top of the mattress. When the parts are in the position shown in Fig. 6, the bedding may be changed without annoyance to or disturbance of the patient and without the expenditure of unnecessary energy on the part of the attendant.

It will also be understood that by the use of tapes of the right width or by the right spacing between the tapes 72, the apparatus just described may be used whenever the bedpan is in demand.

In Figs. 7 to 11, the frame A and support 40 are quite like the apparatus shown in Figs. 5 and 6. However, the rectangular frame 65 is omitted together with the cross member 45 near the free ends of arms 42 and the attaching hangers 46. The support 40 is provided with a patient lifting and swinging device designated generally by numeral 80. This device comprises a triangular support frame consisting of a horizontal member 81, a vertical member 82 attached to the middle of member 81 and inclined members 83 constituting a triangle and brace members 84. Preferably these members are made from tubing and pipe fittings. The vertical tube 82 has a T at its lower end in which the ends of two horizontal tubes are fastened to form the horizontal member 81. The inclined members are provided at their lower ends with fittings 85 slidably surrounding arms 42 and are attached at their upper ends to vertical member 82. Brace members 84 have fittings 86 at their lower ends slidably surrounding arms 42 and at their upper ends are attached to vertical member 82. This support frame 80 is slidable longitudinally on arms 42 and the vertical tube 82 is braced against movement out of a substantially vertical position by tubes 83 and 84. Vertical tube 82 is provided with a shaft 87 supported by a thrust bearing 88 at the upper end of tube 82. At its lower end shaft 87 is provided with a block 89 to which is secured a rectangular frame 90 consisting of two cross members 91, two longitudinal side members 92 and two sets of end members 93. Members 94 are slidably mounted on members 93 and are approximately half as long as those members. Outwardly and downwardly extending members 95 are secured, as by weld-

ing or in any other suitable manner, to the undersides of members 94. Members 95 are arranged in pairs and each pair at its lower end is connected to an elongated bed plate 96. These plates 96 are movable toward or away from one another by sliding the supporting members 95 on end members 93. Preferably members 91, 92, 93, 94 and 95 are made from tubing.

When it is desired to lift a patient off a bed and transport the patient to some other location, or merely to raise a patient enough to permit changing of the bed linen and the like, in the event that the rectangular frame of Figs. 5 and 6 is not used, the above described lifting and turning device may be operated as follows: The frame A is moved into position adjacent the side of the bed with the lifting and turning device 80 being above the patient. This device is rotated, if necessary, to bring the bed plates 96 parallel to the sides of the patient's body. Then the carriage 9 is lowered until those plates are approximately in contact with the top of the bed, i. e., until they can be slid horizontally under the patient. Preliminary to this latter adjustment, the support frame may be shifted longitudinally on the support 40 to locate the patient relative to the carriage in any manner desired. Then the members 95 are moved toward one another by sliding their supporting tubes 94 endwise on tubes 93 with coincident movement of the bed plates underneath the patient. When the plates have been moved toward each other as far as possible and are under the patient, the hydraulic lift may be actuated and the carriage 9 moved upwardly in its guide far enough to lift the patient clear of the bed. Then the patient may be transported to some other location while suspended in that position or the block 89 and the rectangular frame attached thereto may be rotated about the axis of shaft 87 so that the patient is parallel to arms 42 or at any other desired angularity to those arms. When the patient is to be discharged from this apparatus, the hydraulic lift is manipulated to permit lowering of the carriage and when the bed plates have been lowered onto a support for the patient, they may be retracted from beneath the patient by sliding tubes 94 along their supporting tubes 93 until the plates clear the sides of the patient whereupon the hydraulic lift may be actuated to raise the lifting and turning device 80 until the bed plates are above the patient whereupon the apparatus may be moved away from the bed.

It will be noted that in each of the above described modifications of the invention the apparatus may be moved readily about from place to place on its rollers and casters; that by extending underneath and above the patient-supporting part of the bed it does not interfere with any parts of the bed and yet the patient-supporting attachments may reach the patient whether he be on one side or the other of the bed. The base of the frame A may extend under the bed and be perpendicular to the side of the bed while the patient-handling attachment is similarly positioned relative to the bed and while the carriage guide is parallel to the side of the bed. Since the legs of the base are not too far apart the apparatus can be placed in many different positions between the ends of the bed. Thus a patient may be reached and handled in any position on the bed. Since the arms 25 and 42 extend longitudinally of the legs of base 1 and are closer together than those legs, the center of gravity of the weight carried by the apparatus is between those legs and as a result the apparatus is stable and not subject to tipping or overturning. Also, the weight is distributed more or less equally over all the wheels and casters.

When the apparatus is not in use, it may be stored without difficulty because chairs and the like may be placed between the legs of the base and the patient supports may be raised to clear the chairs. The hydraulic lifter makes it possible to raise and lower a patient with the exertion of but little energy on the part of the attendant and the

task of turning or rolling a patient and of changing the bed linen and even of transporting a patient from bed to chair and vice versa or from one bed to another can all be performed by one person and with but little effort.

While the herein illustrated modifications of the invention employ tubing for many of its parts, as has been specifically stated hereinabove, it is to be understood that structural parts of other than tubular shape may be employed if desired without departing from the spirit of this invention.

It will also be understood that means other than the illustrated hydraulic lift may be used for raising and lowering the carriage; and that numerous variations in, and alterations of, the several structural parts of the apparatus may be made. All such changes, variations and alteration which do not involve invention are intended to be included within the scope of what is claimed.

What is claimed is:

1. Apparatus of the class described comprising a U-shaped base having parallel, widely spaced legs, a carriage guide including upright parallel members attached at their lower ends to said base near the U bend thereof and connected together at their upper ends, a carriage movable up and down along said guide, and patient handling means connected to said carriage, said means including a pair of arms pivoted to said carriage for horizontal swinging movement toward and away from each other, half seat plates extending toward each other from the free ends of said arms, and means for securing said arms in position with said seat plates in proximity to each other.

2. Apparatus of the class described comprising a U-shaped base having parallel, widely spaced legs, a carriage guide including upright parallel members attached at their lower ends to said base near the U bend thereof, and connected together at their upper ends, a carriage movable up and down along said guide, and patient handling means connected to said carriage, said means including a pair of arms pivoted to said carriage for horizontal swinging movement toward and away from each other, half seat plates extending toward each other from the free ends of said arms, stops projecting from the arms to limit the minimum space between said plates, and means for securing said arms in position with said seat plates in proximity to each other.

3. Apparatus of the class described comprising a U-shaped base having parallel, widely spaced legs, a carriage guide including upright parallel members attached at their lower ends to said base near the U bend thereof,

and connected together at their upper ends, a carriage movable up and down along said guide, and patient handling means connected to said carriage, said means including a pair of arms pivoted to said carriage for horizontal swinging movement toward and away from each other, braces pivoted to the carriage above said arms and attached to the latter intermediate their ends, half seat plates extending toward each other from the free ends of said arms, and means for securing said arms in position with said seat plates in proximity to each other.

4. Apparatus of the class described comprising a U-shaped base having parallel, widely spaced legs, a carriage guide including upright parallel members attached at their lower ends to said base near the U bend thereof, and connected together at their upper ends, a carriage movable up and down along said guide, and patient handling means connected to said carriage, said means including a pair of arms pivoted to said carriage for horizontal swinging movement toward and away from each other, braces pivoted to the carriage above said arms and attached to the latter intermediate their ends, half seat plates extending toward each other from the free ends of said arms, stops projecting from the arms to limit the minimum space between said plates, and means for securing said arms in position with said seat plates in proximity to each other.

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